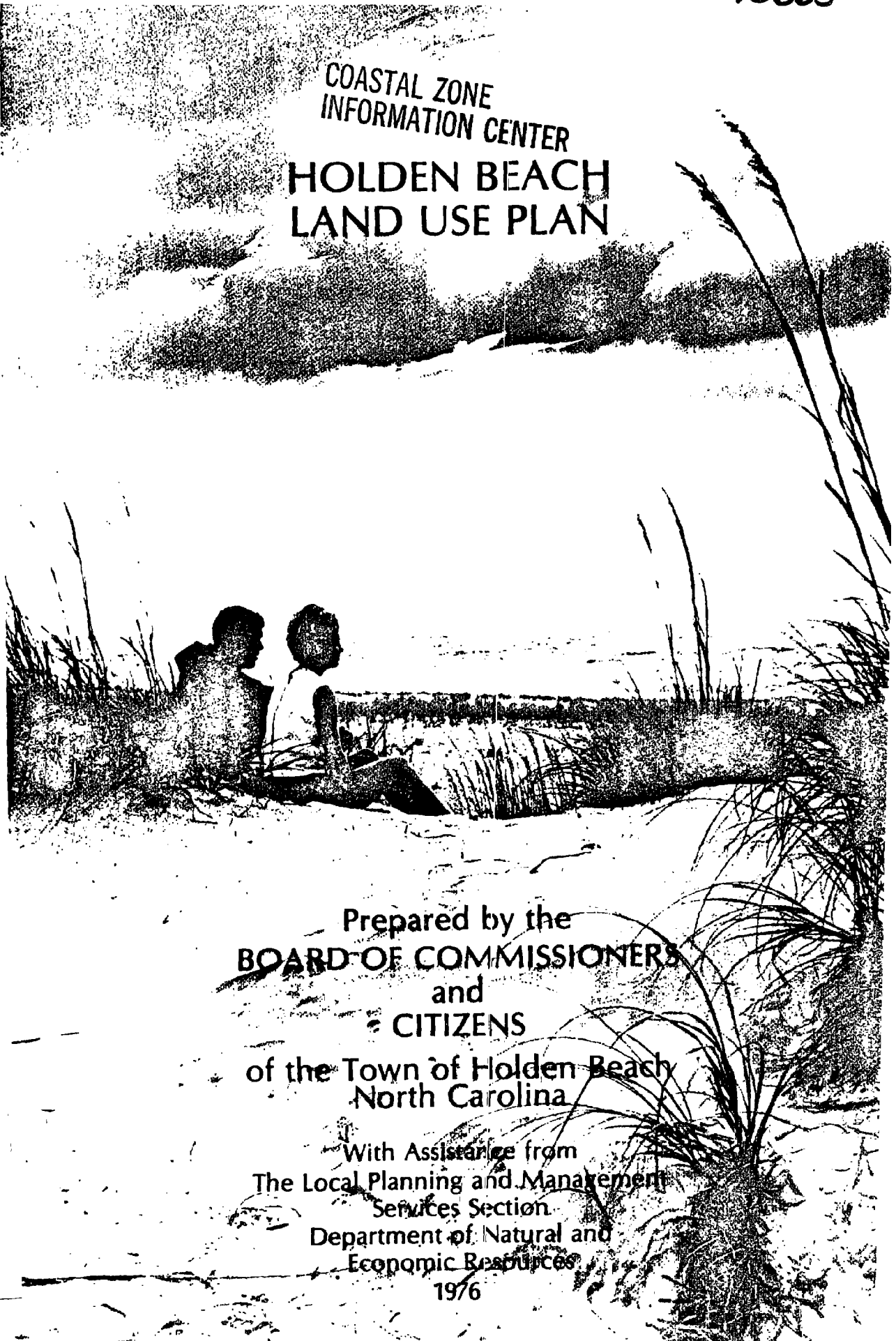


COASTAL ZONE
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HOLDEN BEACH LAND USE PLAN



Prepared by the
BOARD OF COMMISSIONERS
and
CITIZENS

of the Town of Holden Beach
North Carolina

With Assistance from
The Local Planning and Management
Services Section
Department of Natural and
Economic Resources
1976

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N.C. COASTAL RESOURCES COMMISSION

COASTAL ZONE INFORMATION CENTER

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Article I - Introduction

The Coastal Area Management Act of 1974 is a state law that asks local governments in 20 counties in Coastal North Carolina to prepare a blueprint for their future growth and development. It is a cooperative program--local government shall have the initiative for planning; State government shall establish Areas of Environmental Concern. With regard to planning, State government shall act primarily in a supportive standard-setting and review capacity. Enforcement shall be a concurrent State-local responsibility.

Why plan? We only have to look in our own backyard to answer this question. For as the General Assembly stated in the passage of the Act . . . "among North Carolina's most valuable resources are its coastal lands and waters. The coastal area, and in particular the estuaries, are among the most biologically productive regions of this state and of the nation. Coastal and estuarine waters and marshlands provide almost 90 percent of the most productive sport fisheries on the east coast of the United States. North Carolina's coastal area has an extremely high recreational and esthetic value which should be preserved and enhanced.

In recent years the coastal area has been subjected to increasing pressures which are the result of the often conflicting needs of a society expanding in industrial development, in population, and in the recreational aspirations of its citizens. Unless these pressures are controlled by coordinated management, the very features of the coast which make it economically, esthetically, and ecologically rich will be destroyed."

Throughout the preparation of the Holden Beach Land Use Plan, every effort has been made to secure public participation. Among the vehicles utilized to inform the public and to solicit their involvement are: public meetings held by the Planning Board, Town Council, and Holden Beach Property Owners Association; weekly newspaper coverage of meetings and discussion of beach issues by a resident correspondent; and informal meetings with town citizens to discuss results of a survey mailed to over 1100 property owners.

On November 19, 1975, the preliminary draft of the Holden Beach Land Use Plan was presented to the Planning Board and Town Council for their review. Also, a copy was forwarded to the Coastal Resources Commission as

required by State Guidelines. By January, the Town of Holden Beach had received review comments on the preliminary draft conducted by some two dozen state and federal agencies along with the Coastal Resources Commission.

Appropriate revisions were made and additional public meetings and hearings completed. The Town of Holden Beach adopted a final draft on May 18, 1976.

Elements of the Land Use Plan include a statement of local land use objectives, policies and standards, a summary of data collection and analysis, an existing land use map, a land classification map, and detailed description of proposed Areas of Environmental Concern. The Table of Contents of the Land Use Plan suggests the scope of this document which is influenced by the outline of required and optional data in the "State Guidelines for Local Planning . . ." as adopted by the Coastal Resources Commission on January 27, 1975, and amended on October 15, 1975.

Article II - Present Conditions

Section 1: Population and Economy

The 1970 permanent population of Holden Beach was 136. Past population figures are not available because the Town was not incorporated until 1969. Also, population characteristics, such as sex and age, are unavailable at this time; however, an attempt will be made to estimate future population projections up to 1994 based on available data.

In 1950, the estimated population of Holden Beach was 30; in 1960, this figure remained approximately the same.¹ The lack of increased population was a result of hurricane "Hazel" which struck the coast in 1954 causing widespread damage, particularly to the lower Brunswick County beaches. By 1970, the permanent residents of the Town had increased to 136 or a 353 percent increase.

These figures should not be considered rigid or binding on the Town since they do not take into account social and economic factors occurring over the next twenty years; nor do they take into effect such factors as water and sewer facilities, cost of land acquisition, and environmental factors affecting future development.

By far, the most dominating industry of Holden Beach is tourism--not the Myrtle Beach type tourism, but on a much smaller and different scale. The resort business in Holden Beach is predominately cottage and apartment rental in nature, with local realtors renting on a daily, weekly, or monthly basis. The Holden Beach Fishing Pier Motel is also available to people who desire this type of unit as opposed to single-family cottages or apartments.

With respect to other densely populated tourist areas along the coast, Holden Beach does not have the carnival atmosphere as some other areas do. It is not expected that Holden Beach will ever become such an area.

Commercial fishing is the only other industry located in Holden Beach. This industry is very small with little chance for any major expansion. However, to remain prosperous, Lockwoods Folly Inlet and the Shallotte Inlet must be dredged to accommodate larger commercial vessels.

¹ Interview with John Holden, November 1973

It is doubtful whether any large scale industry would locate in Holden Beach for many reasons. Most of the industrial location should and would locate more inland, away from the beach itself. The resort industry appears to be the major industry to continue to dominate Holden Beach's economic development in the future.

Section 2: Existing Land Use²

There are approximately 1,765 acres of land on Holden Beach of which 144 acres are urban and built up. In July, 1973, the following uses and percentages constituted the 144 acres:

<u>Use</u>	<u>Acreage</u>	<u>Percentage</u>
Residential	107	74.3
Commercial	9	6.3
Public and Quasi Public	23	15.9
Mobile Homes	<u>5</u>	<u>3.5</u>
Total	144	100.0

See accompanying Land Use Map.

Residential Land Use--The amount of residential land in Holden Beach includes 107 acres or 6.3 percent of the total developed land in the Town. Residential use as it applies to Holden Beach includes all single and two-family dwellings and apartments. The nature of this residential land use is primarily single-family resort cottage-type development. Most of these homes are seasonally occupied (83 percent), while 17 percent are year-round owner occupied. There is no real concentration of permanent homes in any particular area of the Town, just as there is no permanent concentration of rental cottages. Both permanent and rental homes appear to be scattered throughout the Town along Ocean Boulevard as well as along the canals. Almost all of the 570 residential structures on Holden Beach could be classified as sound with no unsound structures existing.

Although the mobile homes classification was categorized separately, mobile homes do constitute a residential structure and should be looked upon as such. Mobile homes, both in parks and on individual lots, consisted of

²N.C. Dept. of NER, DCA, *Land Use Survey and Land Development Plan, Holden Beach, North Carolina*, November 1974

EXISTING LAND USE MAP

(See Foldout)

five acres of total land or 3.5 percent of developed land. By far, the largest concentration of mobile homes is in the mobile home park just west of the fishing pier. Some of these mobile homes, both in the park and on individual lots, could be classified as unsound. Some, at least, should be able to present a more pleasing appearance to other compatible residential structures.

Commercial Uses--Next to mobile homes, commercial uses account for the second lowest percentage of uses in the Town. Commercial uses generally consist of fish and bait shops, a few seashell shops, one small grocery store, and several small motels. Most of the commercial enterprises in the Town are tourist, or at least season oriented. Commercial uses comprise nine acres of total land, accounting for 6.2 percent of developed land in the Town.

The existing pattern of commercial development is concentrated along the entrance to Holden Beach on both sides of Jordan Boulevard. The Holden Beach Fishing Pier and recreation area also constitute a small cluster of commercial development together with the Surfside Pavillion and several bait and fish stores east of the bridge along the Intracoastal Waterway. A Central Business District (CBD), as the name implies and as planners know, does not really exist in Holden Beach. This is to be expected and may continue to remain as such, since Holden Beach is resort oriented with peak populations occurring in the summer months; thereby, the Town is currently not capable of supporting a well defined, high density CBD. As time goes on, however, this could change.

Motels or hotels are few in Holden Beach and occupy only a small percentage of developed land. The motel by the Holden Beach Fishing Pier and the one adjacent to Sanddollar Drive are the only motels in the Town. Both are small, having only between eight and ten units.

Public and Quasi-Public Uses--The land uses in this category include churches, campgrounds, and other recreational facilities, post offices, town halls, water treatment plants, fire stations and police stations. For the purposes of Holden Beach, four of these apply:

- 1) The Holden Beach Town Hall
- 2) The Post Office
- 3) The Holden Beach Chapel
- 4) The Sand & Sea Campground and Fishing Pier Campground

The above uses constitute 23 acres of total land or 15.9 percent of developed land within the Town. Recreation by far dominates this category, not only by the two private campgrounds in the Town, but also the several miles of beach front. The beach itself is the real "backbone" as to why Holden Beach exists today. Natural recreational development in Holden Beach is of prime importance to the Town and its residents and other property owners, both now and in years to come.

Vacant and Undeveloped Land--This category is not really a land use per se, but does consist of the largest majority of land in the Town. Vacant and undeveloped land accounted for 1,566 acres or 91.6 percent of the total land in the Town. Some of this land, however, is not suitable for development or should not be developed; this would include large sections on both ends of the island.

On the eastern end of the Island by Lockwoods Folly Inlet there has been much erosion over past years. Although "beach berms" are being used to slow the rate of erosion, this area should remain undeveloped in the future. Also the marsh land on the western end of the Island near the Shallotte River should not be developed. Not only is this area of great environmental concern, but it also adds tremendous aesthetic value to the Town. The filling in of marsh land for development should be discouraged whenever feasible.

Any other areas, particularly along the Intracoastal Waterway, which may produce negative effects on the environment if developed should remain in their natural state.

Water and Sewer Service--As mentioned earlier, the present method of obtaining water (from groundwater wells) is rapidly become inadequate to handle present population levels, (much less future population levels) let alone the health hazards that could result by septic tank seepage into existing wells. The Town is moving in the right direction by initiating a water system to handle future development.

The present sewerage system is that of individual septic tanks. However, when the concentration of the effluent nitrification fields and septic tanks saturates the area, a sewer system will be required.

Other Community Services--Garbage collection is provided by the Town which contracts to a local firm to pick up once a week during the winter months and twice a week during the summer. It remains to be seen whether or not an increased collection system will be necessary during the planning period (1974-1994).

Police protection is also offered by the Town with two permanent full-time officers. Fire protection is supplied by the Tri Beach Fire service located across the bridge on the mainland.

Hospitals are located at Southport and Wilmington with rescue service coming from Shallotte.

Section 3: Current Plans, Policies and Regulations

Holden Beach is a new community. It is in a very formative stage in regard to plans and policies; thus, the development of this Land Use Plan has happened at a very critical moment. Much information derived from it should enable the community to formulate needed policies and plans of action.

Existing Holden Beach development regulations are: Subdivision Regulations, Zoning Ordinance, Environmental Impact Statement Ordinance, Mobile Home Tie-down Ordinance, and N.C. State Building Codes (general construction, electrical, plumbing, heating and air conditioning). Enforcement has been hampered by the turnover and lack of training of a building inspector and inadequate support of the governing body.

In order for future growth and development to take place in accordance with this land use plan, then certain amendments to regulations will be necessary. Specifically, if future services are to be provided as economically as possible and not degrade the natural environment; then higher residential densities and more compact-type developments must be allowed and encouraged provided the necessary community facilities are available.

Article III - Public Participation Activities

Section 1: Public Participation Process

Holden Beach is primarily a vacation community with over 1100 property owners and only 180 permanent residents. Because of this, the Town decided to use a combination of public meetings and surveys in order to involve the public. Three public meetings--two called by the Town Council and one by the Holden Beach Property Owners Association--were well attended and informative. A 30 percent response was received from the mailed (1100) questionnaires. The Nominal Group Technique was employed at one meeting to identify and prioritize issues as perceived by that group. At other public meetings, the discussion centered on identification of AECs. In addition to these efforts, numerous informal open meetings were held and the events which transpired were reported by a local correspondent to the two weekly newspapers. The survey and the meetings were responsible for the identification of problems and issues. Further discussion of these issues with public officials and individuals resulted in the articulation of the Beach's goals and objectives.

During the month of August, 1975, the Town of Holden Beach conducted a survey to solicit citizens' opinions and attitudes toward the use of the Town's land--both public and private. The survey was mailed to 1110 property owners on file at the Town Clerk's office.

The following represents an analysis of opinions of approximately 28 percent who responded to the survey. This may be broken down as follows: 281 responses were from non-resident property owners; 20 returns were from permanent resident property owners; and 8 were from renters.

Visitation Frequency

The third question asked how often do you reside in Holden Beach? Of the non-resident property owners, 42 percent reside there on the weekends, 38 percent spend several weeks and 18 percent reside there only during the summer months. Of the renters, five people indicated their preference for several weeks (most probably during summer) and two people preferred the weekends.

First Knowledge of Holden Beach

The next question asked how one first learned about Holden Beach? Of the 285 responses from non-resident property owners, 59 percent checked

from a friend or relative, 23 percent learned on a previous vacation, and 17 percent from other means. From the renters, a similar pattern of response was indicated: six learned from a friend or relative, while one each indicated from a previous vacation and other--by a job opportunity. It should be noted that none of the renters that responded discovered Holden Beach by advertisement for rental or sale.

Median Age

The median age of the respondent of non-resident property owners is 48 years of age; of permanent property owners 55; and of renters 35.

Present Dwelling Type

One question asked "What type of dwelling unit do you live in at Holden Beach?" Ninety five percent of the non-resident property owners said they reside in a single family dwelling; 37 percent live in a duplex, less than 1 percent each live in a mobile home or apartment. Apparently this question was misunderstood since many of the non-resident property owners have unimproved property only. Fifteen respondents of the permanent resident category reside in single-family dwellings, three reside in duplexes, one in a mobile home, and one in an apartment. Of the renters, most rent either an apartment or single-family dwelling.

Community Growth

The seventh question dealt with the amount of community growth desired. In the non-resident property owner category, 41 percent wanted the beach to remain the same in population. Twenty-eight percent preferred a 10 percent increase in the next five years. Eighteen percent wanted a 30 percent increase. Less than 4 percent wanted a decrease in population. In the permanent resident category, eight respondents wanted it to remain the same. Nine preferred a 10 percent increase in the next five years. The remaining three wanted increases of 30, 50, and 75 percent. In the rental category, four respondents preferred the Beach's population to remain the same, while one each wanted the population to increase 10 and 30 percent. One renter suggested a decrease of 30 percent.

Development Preferences

The eighth question queried, "Which type of development would you like to see more or less in Holden Beach?" Surprisingly enough, all three cate-

gories (non-resident, permanent resident, and rental) wanted the same type of development to occur.

More

single-family housing
public recreation facilities
public open space
commercial services

Less

mobile homes
condominiums
apartments
commercial trade

Also, public boat ramps and tennis courts were requested by several persons.

Reasons for Locating

The ninth question dealt with reasons for selecting Holden Beach as a permanent or temporary place of residence. In most cases, several reasons were indicated thus, of 382 selections by non-residents: 47 percent chose the community because it was a single-family beach and 32 percent because of its pleasant surroundings. The percent preferred was nearly the same in the other two categories of residents, too.

Public Expenditures

The tenth question asked the areas in which people feel more or less public funds should be spent? The programs receiving the highest and least numbers of votes in order by resident category are:

non-resident property owners

More

water and sewer service (189)
erosion control (180)
beach access (130)
fire and police protection (114)
environmental protection (111)
rescue services (97)
medical services (99)
streets (91)
parks and recreation (86)
garbage collection (85)

Less

parks and recreation (27)
schools (26)
town management (25)
beach access (22)
water safety (15)
streets (15)
environmental protection (14)
medical services (13)
water and sewer service (12)
fire and police protection (10)

permanent residents

More

erosion control (18)
beach access (14)
water and sewer service (14)

Less

town management (6)
schools (3)
fire and police protection (3)

permanent residents
(cont.)

<u>More</u>	<u>Less</u>
environmental protection (12)	medical services (2)
parks and recreation (11)	
water safety (11)	
streets (10)	
fire and police protection (10)	
rescue service (10)	
garbage collection (6)	

renters

<u>More</u>	<u>Less</u>
environmental protection (5)	schools (1)
erosion control (5)	water safety (1)
water and sewer service (4)	
rescue service (4)	
beach access (3)	

Furthermore, other programs which were frequently requested were public boat ramps and bicycle path programs. Although one program may appear in both more and less expenditures columns because of the total vote count, it is the relative total number of votes that is meaningful for each program or service.

Likes and Dislikes

The eleventh question asked what one likes most about Holden Beach? The responses occurring most often in all three categories were: quietness, cleanliness, and a noncommercialized and uncrowded beach. The twelfth question asked just the opposite. Items mentioned most frequently by non-residents were: campgrounds, lack of beach access, litter, mobile homes, absence of a laundry and poor streets; by permanent residents: lack of parking, real estate influence, absence of town newsletter, one bridge, property owners association, and absence of water and sewer service; and by renters: inadequately furnished cottages and camping facilities.

Areas for Preservation

Question number thirteen queried whether development should be permitted on lands near inlets, on marshland, and on frontal dunes. Non-resident property owners voted as follows:

	<u>Never</u>	<u>With restrictions</u>	<u>Always</u>
on lands near inlets	113	122	11
on any marshland	161	70	9
on frontal dunes	139	89	9

Permanent residents voted as follows:

	<u>Never</u>	<u>With restrictions</u>	<u>Always</u>
on lands near inlets	9	9	0
on any marshland	11	7	0
on frontal dunes	7	10	0

Renters voted as follows:

	<u>Never</u>	<u>With restrictions</u>	<u>Always</u>
on lands near inlets	1	4	0
on any marshland	3	1	0
on frontal dunes	1	4	0

Question number fourteen followed by asking if one would support the purchase by a public agency of those areas indicated "no development." Of the non-residents, 128 voted yes, while only 62 said no. Permanent residents voted 5 yes and 9 no. Renters voted 3 yes and 1 no.

The fifteenth question asked for a particular area that is unique or special and should be preserved or protected in its natural state. The most frequently mentioned areas of all three categories of residents were: marshlands, dunes, nature trails, and shrimp-boat areas. Thus, there appears to be more than a casual support for areas of preservation.

General Comments

Under question number sixteen, the following comments were frequently written by residents of all three categories:

- continue craft fair and holiday dance
- stabilize the inlet
- develop tennis courts
- encourage support for environmental issues
- provide for maintenance of canals
- control land use strictly
- provide a commercial laundry
- prevent commercialization of beach

Section 2: Land Use Issues

In order to formulate a series of goals and objectives which can in turn be molded into policies for future development, we must identify the major land use issues facing the Town of Holden Beach. The following is a discussion of issues under five broad headings. These issues are current issues and should be considered a refinement of those issues already identi-

fied in the Land Development Plan.³ An issue is defined as "a point of debate or controversy," and only through a discussion of all the issues can we hope to begin to achieve the optimum accommodation of spatial growth.

Impact of Population and Economic Trends

As described in the *Land Development Plan*, Holden Beach has experienced recent growth. Much of this growth has been a result of summer tourism and families retiring and/or building second homes for vacation. Therefore, the economic recession that the nation has been coping with more recently is reflected in the development stall on the Beach, even though Brunswick County continues to enjoy economic boom. It is a difficult task to measure the short-term impact and even more difficult to understand the long-term impact of the development which has occurred. However, we know that unless the proper development policies are implemented this continued growth can cause unmanageable consequences in terms of demand for water and sewer services, health hazards, traffic congestion, spiraling demand for police and fire protection, increased social services demand, unavailability of recreational facilities, and demand for other municipal services also.

The important impact of this new growth is felt upon the policies, ordinances, and administrative mechanisms which are presently in place. Citizen survey, governmental bodies, and public discussion have pointed out the need for adopted growth policies and ordinances which should be enforced by Town officials. Vested interests will continue to exert pressure and influence which may or may not benefit the whole community--on Town policy.

Another impact of recent population and economic trends in Holden Beach has resulted in an increased community demand for "low density sprawl." Low density sprawl occurs when the entire community consists of single-family homes, 75% sited in a traditional grid pattern and the rest clustered. Neighborhoods are sited in a leapfrog pattern with little contiguity. As indicated by the land use survey analysis the Beach exemplifies this point although most of it is a result of growth barriers. Unfortunately, the cost analysis of this pattern of development as compared with "combination mix" and "high density planned" reveals that in every factor such as operating

³N. C. Dept. of NER, DCA, *Land Use Survey and Land Development Plan*, Holden Beach, North Carolina, November 1974

and maintenance cost, water pollution generation, energy consumption, land utilization, water consumption, and capital cost; the overall cost to the neighborhood or community is significantly more.⁴

A most important fact about the development of Holden Beach is the recent platting of lots. Prior to June, 1975, there were approximately 3,632 platted lots. The majority of these lots are approximately 5,000 square feet. There are approximately 600 residential structures located on the Beach.

Since June, 1975, approximately 1,639 additional lots have been platted and recorded in the Brunswick County Register of Deeds Office. The average size of these lots is 5,000 square feet. Like the original developments platted, many of the lots are unsuitable because they cover coastal wetlands and are situated around future "finger canals" which will not receive permits for construction based on today's permit standards.

The impetus for platting a 44 percent increase in lots was to avoid the requirements of *Subdivision Regulations* (adopted September 1, 1975); nevertheless, a poor development pattern is continued.

While new development has been preliminarily proposed with the platting of lots, the island will not be able to accommodate this potential growth without the very necessary community facilities such as water and sewer systems. Yet these services cost money; at the present density it is unlikely that Holden Beach can afford a sewerage system. Ideally, critical facilities should precede development. Yet, these basic community facilities will attract additional development which may well threaten the aesthetic environment.

Another impact of recent population and economic growth has been the increased traffic congestion and lack of accessibility within the Beach as well as to the Beach. Interestingly enough, Brunswick County has one of the highest traffic accident death rates of any county in southeastern North Carolina. Associated with congestion is the potential for water, air, and noise pollution which affects the social as well as the physical environment. While there is a lack of specific monitoring data, engineering calculations would suggest that water and air resources have probably experienced some contamination as a result of previous development.

⁴Real Estate Research Corp., *The Cost of Sprawl, Executive Summary*, April 1974, pages 2-8

Another impact is speculation. Much of the haphazard and unplanned growth occurring on the Beach can be traced to land speculation. Strip developments, like those on Ocean Boulevard, form a thin veneer of intensive land use that hides much larger areas of undeveloped vacant land. Most of these interior lands are being held with the hope that they will eventually command a higher price.

Housing and Other Services

The primary housing problems are varied due to the resort nature of the Beach community. The housing and housing-related controversies are: the lack of water and sewer service and paved streets in the city limits; public concern over subsidized housing; local responsibility for increasing housing opportunity; scattered trash and unkept lots throughout the community; undersized lots and encroachment of development on dunes and marshlands.⁵

Obstacles to solving housing problems include: the lack of an adequate inspection program, lack of enforcement in regards to Environmental Impact Statement Ordinance and Zoning Ordinance.

Substandard homes do not exist on the Beach because it is a retirement and second-home community.

Conservation of Productive Natural Resources

Foremost among Holden Beach's productive natural resources are the applicable Areas of Environmental Concern. A detailed discussion of relevant Areas of Environmental Concern appears later. The designation and enforcement of AEC policy objectives and appropriate uses will no doubt give rise to dispute.

Soils, surface water, groundwater, and air quality are productive natural resources which deserve the utmost consideration in the management of these limited natural resources. A thorough examination of these factors begins under the section entitled "Constraints."

Critical natural resources because of their unproductivity for man are the soils of Holden Beach. As we will see later in this report, soils are important due to their inability to accommodate intensive development utilizing septic tank--nitrification fields.

⁵ N. C. Dept. of NER, DCA, *Initial Housing Element, Holden Beach, North Carolina*, November 1973

The open, highly porous soil structure allows high loading rates and thus invites high-density development. In addition, the rapid movement of effluent through the soil, together with the reduced effectiveness of treatment during this movement, results in high potential for degradation of quality of both surface and groundwater. Indiscriminate and unwise development where septic tank systems are used poses a serious danger of contaminating the adjacent water with fecal coliform and viruses. Even in less densely developed areas the installation of septic tanks in sand fill placed over existing organic muck or marsh vegetation can pollute surface waters. In these situations, septic tank effluent may rapidly move horizontally along the sand muck interface into surrounding surface waters classified either "SA" or "SB" for shellfish harvesting and bathing. Unwise use of septic tank systems appears to be a major cause of large areas of the coastal waters being closed for shellfish harvesting. While this cause and effect relationship has not been positively documented, there is tentative documentation of such a relationship in several areas.⁶

Because of this health hazard, septic tank nitrification fields are an interim solution which should be governed by Regulation 79 as adopted by the Environmental Management Division and Department of Human Resources.

Protection of Important Natural Environments

Probably the most important natural environment on the Beach is the island itself, which constitutes several natural resources. While this environment provides recreation for some and a livelihood for others, it must be remembered that it is solely responsible for the settlement of Holden Beach. Without a doubt, the island and its access to the ocean is Holden Beach's greatest asset. As the community continues to grow there will be added "pressure" for developing the island for a multiple of uses. As the existing land use map indicates the Beach supports a variety of uses already: residential, commercial, governmental, utility, and recreational. Competition for space along Ocean Boulevard will become even more keen. This environment directly affects a high percentage of the residents and

⁶A. C. Turnage, Jr., Regional Engineer, Environmental Management Division, *Shallow Subsurface Disposal of Wastewater* from proceeding on the *Conference on Water Supply and Wastewater in Coastal Areas, Wrightsville Beach, North Carolina*, April 2-4, 1975, page 60

non-residents in the planning area; therefore, it warrants a great deal of protection so that a maximum number of people will continue to benefit from its use.

Protecting the natural environment of Holden Beach cannot be over-emphasized. One must remember that Holden Beach is a barrier island and, as such, is subject to a number of natural processes which are forever changing the environment. As described in Orrin Pilkey's *How to Live With An Island*, there are four natural events that occur which cause the island to grow, to migrate, and change shape. Beach dynamics include: inlet formation, inlet migration, addition of new sand by overwash and/or wind action, and sea level rise. These events do the following: inlet formation causes the island to widen; inlet migration widens the island over the distance of migration; the addition of new sand to the island gives it needed volume and elevation; and the sea level rise causes the shoreline to migrate or retreat landwards. This island evolution is better described: *an island rolls over and over on itself like a tank tread.*⁷

Protection of Cultural and Historic Resources

There are certain unique features that readily represent the character of an area. This is particularly true in Holden Beach. Holden Beach is unique in relation to other beaches to its north and south. For this reason, it continually attracts many visitors and tourists, forming the primary economy of the Beach. Although development has occurred which has been less than prudent, Holden Beach lacks the shoddy commercialism of many neighboring beach communities. Two areas which aid in identifying the character of Holden Beach are the two large tracts of land at either inlet. In fact, the tract of land at Lockwood's Folly Inlet supports a recently organized nature trail. Perhaps this area lends itself more than any other due to the topography, soil conditions, vegetation, and the absence of development.

An event which could be improved and help to emphasize the Town's cultural resources is the Arts and Crafts Fair held each summer. A local information center to house exhibits and to provide information about the community would serve a vital community interest.

⁷Pilkey, Orrin H. and others. *How to Live with An Island*, N. C. Dept. of NER, 1975, page 9

Section 3: Development Alternatives

Long Range

Since the primary land use in Holden Beach is residential, we can use net residential density to describe three development alternatives: *low* density, with 1 to 8 dwelling units per acre; *medium* density, with 8 to 16 dwelling units per acre; and *high* density, with 16 dwelling units or more per acre. The following discussion assumes the availability of the necessary municipal water and sewer service.

Current zoning regulations permit approximately 6.6 dwelling units per acre once right-of-ways and easements are subtracted. Using the above standard, this is low density which consists almost entirely of single-family dwellings in a traditional gridiron pattern. This type of development is an easy route for municipal approval and a moderate land value return. However, land consumption is high and cost benefit ratio for municipal utilities is high.

At the other end is high density development, with 16 dwelling units or more per acre, which necessitates multi-storied structures. While marketability is often questionable, this density provides greater land value return. It is a more economical way of providing services. Based on available information, approval is unlikely by the municipal governing body because of local sentiment and prejudice.

Right in the middle of these two extremes is medium density, with 8 to 16 dwelling units per acre. This density may be accomplished by the use of cluster development of townhouses. This type of development affords lower land consumption, better cost-benefit ratio for municipal services, and positive compromise on other factors. Clustering in small groups would result in minimum visual change to the property and marketability would seem high. However, this density would require amendments to development regulations.

However, recognizing that the unit family cost to provide water and sewerage facility for a low density classification is high relative to that for a high density classification, the property owners have expressed their preference via survey for the low density pattern. If at a later date, the cost proves to be greater than the property owners are willing to pay, the density will be modified accordingly.

Short Range

Approximately 670,000 acres or 1/3 of the State's coastal waters are closed to our oyster and clam fishermen. Most areas are closed every year. State and federal agencies readily admit that existing rules and regulations do not adequately control the problems associated with the use of septic tanks--in sandy soils where shallow wells are used for water supply, and where development is adjacent to bodies of water as in the coastal area. Simply stated, the ability of the natural and man-made systems of the area to support the demands of various land uses is approaching its limits (carrying capacity). It is unknown when the area will exceed its capacity; yet, then it will be too late.

The solution is to have acceptable water supply and wastewater treatment systems serving the Island. However, because of more pressing priorities at the County, State, and Federal level, an inordinate amount of time and expense will be required to construct these systems. Water system construction has been estimated to require another two years; while sewerage is conservatively estimated to be seven years from reality.

What happens to Holden Beach in the interim period prior to water and sewer system service? Do we allow development to continue at its present pace, risking public health and environmental degradation? Or do we opt for controlled growth requiring the necessary water and sewer service systems by placing a temporary moratorium on development? At a minimum we can establish a continuous monitoring program of our surface waters to alert us of declining water quality.

Section 4: Objectives and Policies for Dealing with Issues

A great deal of development pressure has already been exerted upon Holden Beach. Consequently, the overall appearance of the community shows signs of change and will no doubt continue to do so. The amount of change tolerated depends upon the citizens of the community. From all available information (surveys, interviews, public meetings), people in Holden Beach want a viable community; yet, they do not want to lose the assets which the community presently enjoys. It is imperative that the Town's elected and appointed officials and citizens vigorously support the goals and objectives enumerated below. Only when these goals and objectives are adopted and adhered to, as the Town's policies for land development and future growth,

will the community retain the pleasant characteristics it has today. Planning is pointless unless the plan impacts decision making.

In order to avoid any misunderstanding, the frequently used terms of *goal*, *objective*, and *policy* are defined as follows:

Goal--a desired future condition;

Objective--a task or course of action to be performed; and

Policy--a commitment to action to reach a goal.

In the broadest sense, the goal of the Beach is to improve the social, economic, and physical environment of the community as economically as possible. Within this broadly stated goal, several specific goals and objectives relating to the physical development of the area can be stated.

Goal: Provide a management system capable of preserving and managing the natural resources in Holden Beach.

Objectives:

- Designate a Code Enforcement official to enforce the adopted N.C. State Building Code, Subdivision Regulations, Zoning Ordinance, and Environmental Impact Statement Ordinance.
- Support the findings of fact and recommendations of appointed boards, commissions, and professional staff.
- Prevent development in any Area of Environmental Concern which would result in a contravention or violation of any rules, regulations, or laws of the State of North Carolina or of the Town of Holden Beach.
- No development shall be allowed in any AEC which would have a substantial likelihood of causing pollution of the waters of the State to the extent that such waters would be closed to the taking of shellfish under standards set by the Commission for Health Services pursuant to G.S. 30-169.01.
- Adopt a flood plain district as part of the Zoning Ordinance which would protect the flood prone areas as identified by the U.S. Corps of Engineers and HUD - Federal Insurance Administration.
- Employ full-time qualified personnel in order to improve the City's management capability.
- Prohibit future construction or expansion of finger-canal type residential developments.

Goal: Develop adequate and efficient public utilities and community facilities.

Objectives:

- Encourage development near the bridge and avoid "urban sprawl."
- Construct an efficient and economical water system for all people.
- Construct an efficient and economical wastewater treatment system.
- Acquire title or permanent use to beach access ways for all citizens to enjoy beach recreational activities.
- Limit future commercial establishments on the beach to convenience-type shopping facilities.

Goal: Insure safe, decent, and a variety of housing for all citizens.

Objectives:

- Permit higher density of residential development in order that services and facilities can reasonably be provided.
- Adopt a minimum housing code.
- Enforce ordinances to protect homeowners from natural hazards.

Goal: Promote accessibility and safety in area transportation.

Objectives:

- Emphasize safety and a continuous street improvement and construction program.
- Review thoroughly new residential development plans and insure that they comply with Subdivision Regulations.
- Mutually adopt a detailed thoroughfare plan with the N.C. Department of Transportation, Division of Highways.

Goal: Preserve the existing character and the aesthetic qualities of Holden Beach.

Objectives:

- Establish an appearance commission to preserve the community's aesthetic quality, with power to review architectural plans in accordance with G.S. 160A-451.
- Promote the cultural amenities of the community by organizing and sponsoring an information center and community-wide events.
- Establish an adequate park and recreational area on either end of the island.

Article IV - Constraints

Section 1: Land Potential

An analysis of land potential and capacity of community facilities will aid in determining a land classification map. Moreover, it will give a more complete picture of the Holden Beach environment.

a. Physical Limitations

Hazard Areas

While there are no man-made hazard areas on Holden Beach, there are three natural hazards. These are: ocean erodible areas, estuarine erodible areas, and flood hazards.

Coastal Erosion

Coastal erosion is the process by which land adjacent to tidal areas is eroded by wave action and tidal currents. Coastal land areas are generally in a constant state of flux, eroding and accreting on a regular basis. However, this period of flux can be short, seasonal, or long over a number of years. Erosion of the shore is the condition where the rate of soil displacement exceeds the rate of replacement.

Essentially, there are three causes for coastal erosion: (1) normal geologic changes, (2) storm conditions, and (3) changes made by man. Normal changes in the coastal and sound areas have occurred for centuries. One such change currently affecting North Carolina is a rising sea level, which aggravates erosion conditions. Storm conditions accentuate the effects of wave and wind action on coastal and sound areas. Storm and wind-generated surges raise the water level, thereby exposing natural (dune) protection and vulnerable areas to erosion. Additionally, storm waves move much more soil than ordinary waves. Man-made changes are probably the most detrimental. Development in areas susceptible to erosion, particularly the coastal area, is a primary factor. Once the investments have been made, it becomes necessary to protect them. Additionally, structural measures, such as single or multiple-purpose reservoirs, channel stabilization projects, beach protection projects, etc., change the normal patterns of coastal erosion and accretion by changing the natural sediment conditions of feeder streams.

Ocean erodible areas are the areas above mean high water where excessive erosion has a high probability of occurring. In delineating the landward

extent of this area, a reasonable 25-year recession line shall be determined using the best scientific data available. The Center for Marine and Coastal Studies at North Carolina State University has identified a probable recession line from the toe of the dune for one in twenty-five years storm return frequency at Holden Beach Pier as approximately 199 feet.⁸

Estuarine, sound, and river erodible areas are defined as the areas above ordinary high water where excessive erosion has a high probability of occurring. In delineating the landward extent of this area a reasonable 25-year recession line shall be determined using the best available information.

A preliminary reconnaissance survey to determine the trend of shoreline erosion in the lower reaches of Cape Fear, Lockwoods Folly, and Shallotte Rivers revealed no evidence of significant shoreline erosion.⁹ However, discussions with local residents have indicated erosion problems along the Intracoastal Waterway, particularly in development projects which have "finger canals."

In regard to flood hazards there are two types: "riverine" which is caused by precipitation and "coastal flooding," caused by wind-driven water by the coincidence of storm and high tides. There is no coastal hazard areas comparable to the riverine "floodway" which must be maintained free of obstructions to convey flood flows. This is perhaps the most important difference between coastal and riverine-area regulations. Coastal regulations are not designed to preserve flood flows yet high hazard coastal areas deserve special attention. Beaches and shorelines are buffeted by high energy waves that destroy all but the strongest structures. At Holden Beach special regulations are needed not only to protect dunes, but also to protect other natural protective barriers which blunt the force of wind and waves and minimize property damage.

Many coastal communities are constructed at the confluence of a river and the sea, a location subject to both riverine and coastal flood problems. Here regulations pertaining to both sorts of problems are needed. Special regulations are also needed to meet island drainage problems at many coastal locations even without a major river or stream. Torrential rains accompany hurricanes and coastal storms often overtax drainage channels. Flood problems

⁸Knowles, C. E., Jay Langfelder and Others *A Preliminary Study of Storm-Induced Beach Erosion for North Carolina* North Carolina State University October 16, 1973

⁹Hunnings, L. D., Area Engineer, Soil Conservation Service *Inland Shoreline Erosion Study Brunswick and New Hanover Counties* January 30, 1975

arise if seawalls, dikes, or other engineering works constructed to prevent flooding by onrushing seas block the seaward flow of water from inland drainage channels.¹⁰

Holden Beach (community no. 375352B) is an eligible community for Federal Flood Insurance under the regular program. FIA Flood Insurance Rate Map dated May 2, 1975, indicates two zones: All - an area of special flood hazards with base flood elevations and V11 - areas of special flood hazards, with velocity, that are inundated by tidal floods. In both zones the base flood elevation is 14 feet above mean sea level.

Soils

The soils of an area greatly determine the extent of present development and suitability for future growth. Unless an area has proper soils, urban development that occurs will be costly and may pose a health hazard. Soils occurring together in a characteristic and repeating pattern constitute a general soil area or soil association. An association consists of two or more major soils and at least one minor soil and is named for the major soil. The *Land Development Plan, Holden Beach, North Carolina* has identified the location of two soil associations and an interpretation of each. However, the Soil Map indicating the location of the two associations is of such a general nature that it is of little value in planning for future development.

The U.S. Department of Agriculture, Soil Conservation Service is preparing a more detailed soil survey for the Outer Banks and barrier islands of North Carolina. Fortunately some of the preliminary information about soils has been compiled and made available.¹¹ A preliminary map appears on the following page which shows the location and extent of eight soil-mapping units, some of which are soil series on Holden Beach. Such a map provides the general soils data needed to plan the efficient use and orderly development of the community's soil resources. The soil map is useful for (1) those who want an idea of the soils, (2) those who want to compare the potential of different parts of the planning area, or (3) those who seek the location of areas suitable for specific types of land use. It is not designed to show

¹⁰U.S. Water Resources Council, Washington, D. C. *Regulations of Flood Hazard Areas* Vol. II parts V-VI 1971 page 122.

¹¹Simpson, Glen, Soil Conservation Service, Shallotte, N.C. October 24, 1975.

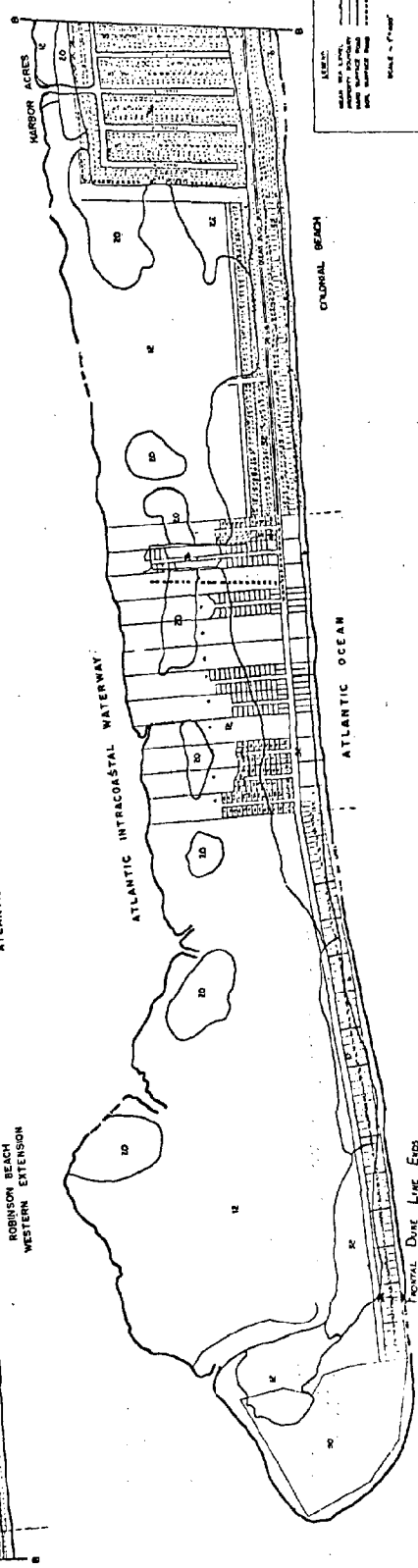
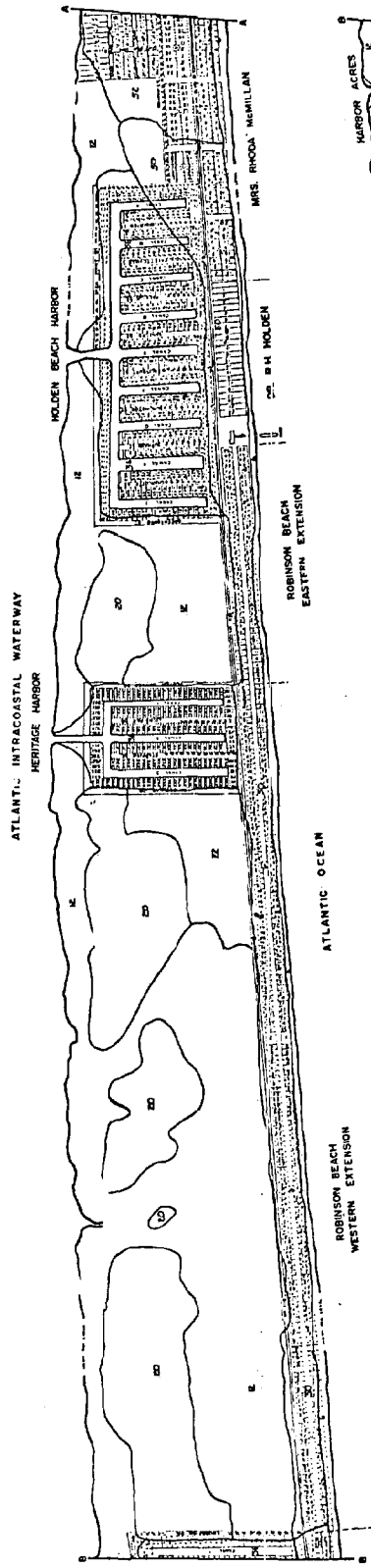
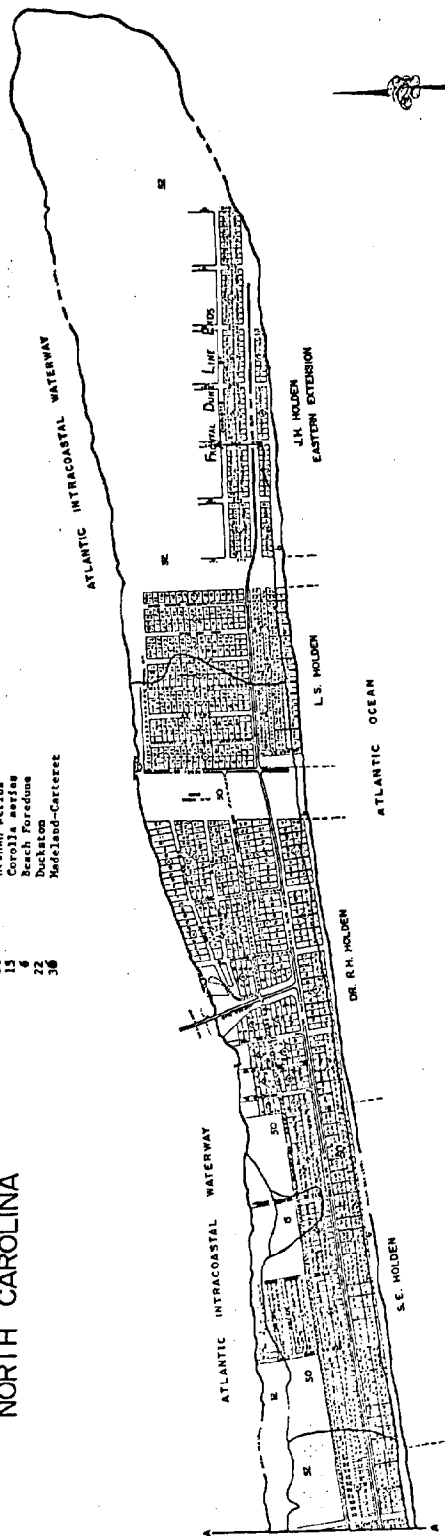
HOLDEN BEACH NORTH CAROLINA

Map Symbol

20	Soil Mapping Units
12	Dredge Fill Islands
52	Carpet low sandy tidal marsh
50	Neohum-corolla complex
15	Neohum verica
4	Corolla verica
22	Beach Foredune
38	Ductation
	Madeland-Carteret

Soil Mapping Units

20	Dredge Fill Islands
12	Carpet low sandy tidal marsh
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50	Neohum verica
15	Corolla verica
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22	Ductation
38	Madeland-Carteret



LEGEND
 Dredge Fill Islands
 Carpet low sandy tidal marsh
 Neohum-corolla complex
 Neohum verica
 Corolla verica
 Beach Foredune
 Ductation
 Madeland-Carteret

Scale = 1" = 100'

Prepared by: J. L. McMillan
 Date: 1971
 1:10,000

accurately the kinds of soil on an individual tract of land and is not suitable for planning such units of land.

The table below indicates the approximate acreage and percentage of the total of the eight soils mapped. The Newhan-Corolla complex is used when these soils are found in such an intricate pattern that they can't be separated on the map. The Madeland-Carteret (Duckston) is used when dredge material has been dumped onto the marsh and canal lots have been created from this. The Duckston is a small area and may be included with Carteret for interpretation since it is very similar with respect to physical location, similar vegetation, and similar soil characteristics. The Beach fore dune is not dune land but represents only the frontal dune.

HOLDEN BEACH SOILS			
<u>Map Symbol</u>	<u>Soil Mapping Units</u>	<u>Acres</u>	<u>Percent of Total</u>
20	Dredge fill islands	147.8	8.4
12	Carteret-Low, sandy tidal marsh	591.4	33.5
52	Newhan-Corolla complex	322.6	18.3
50	Newhan series	310.2	17.6
15	Corolla series	56.0	3.2
6	Beach fore dune	144.5	8.2
22	Duckston series	36.0	2.0
36	Madeland-Carteret	156.8	8.8
	Total	1765.3	100

On the following page is a Soil Interpretation Chart. This chart describes the general soil characteristics and their suitability for specific types of uses for three soil series.

Because they are biologically productive, Dredge fill islands, Carteret-Low sandy tidal marsh, and Beach fore dune are prohibited from future development. From the Soil Interpretation Chart, we see that the three soil series are generally unsuitable in their natural state for community-development type uses and that only the Newhan series is provisionally suitable for septic tanks. Sandy soils are deceiving in regard to use as soil absorption systems. When water is applied to sandy soils, it dissipates very rapidly. However, this does not permit soil any holding capacity to absorb the waste. Consequently, the waste flows quickly to ground-water aquifers which eventually intersect the surrounding surface water. Therefore the Beach is quite limited in its natural state to accommodate intensive development.

SOIL INTERPRETATION CHART

Soil Series	Slope	Setting	Flooding	Seasonal High Water Table	Drainage Class	Pot. for Drainage Most Restr. Layer	Special Limitations
Newhan	2-7-30%	Sand dunes	Infrequent - only by coastal storms	5 ft. +	Ex. W. D.	Not needed 20"/hr. 0-64"	Subject to severe erosion by severe storm tides
Corolla	0-4"	Between sand dunes	Frequent	Within 1½-3' of surface Jan.-Dec. 2 mo.	S. P. D.	Poor outlets 20"/hr. 0-72"	Subject to erosion by severe storm tides
Carteret	0-2%	Salt marsh flats	Daily or monthly	At or within 1' of surface 2 mo.	V. P. D.	Poor outlets 6"/hr. at 0-80"	Salt marsh

Suitability for Community Development

Soil Series	Local Roads & Streets				Roadfill			Topsoil		Limitations
	Dwellings	Limitations	Limitations	Limitations	Limitations	Limitations	Limitations	Limitations	Limitations	
Newhan	Unsuit.	High storm tides	Unsuit.	High storm tides Soil binder needed	Suit.	Unsuit.	Too sandy	Unsuit.	Too sandy	
Corolla	Unsuit.	SHWT High storm tides	Unsuit.	SHWT High storm tides	Prov. suit	SHWT	Unsuit.	Too sandy	Too sandy	
Carteret	Unsuit.	High water table flooding	Unsuit.	High water table Flooding	Unsuit.	SHWT	Unsuit.	Too sandy	Too sandy	

SOIL INTERPRETATION CHART

Suitability for Sanitary Facilities

Soil Series	Septic Tank	Sewage		Sanitary Landfill	Ponds		Limitations
		Limitations	Lagoon		Limitations	Very rapid perm.	
Newhan	Prov. Suit	May pollute water supplies v. rapid perm.	Unsuit.	Unsuit.	Unsuit.	Very rapid perm.	Very rapid perm.
Corolla	Unsuit.	SHWT	Unsuit.	Unsuit.	Flooding SHWT	Erosion potential	Very rapid perm.
Carteret	Unsuit.	High water table Flooding	Unsuit.	Unsuit.	High water table Flooding Seepage	Unsuit.	Rapid perm.

Source:

Joseph A. Phillips and others,
Soil Associations of the Coastal
Area Management Region
Soil Cons. Service and NCSU
Raleigh June 29, 1975.

Abbreviations:

W.D. - Well drained
S.P.D. - Somewhat poorly drained
P.D. - Poorly drained
V.P.D. - Very poorly drained
M.W.D. - Moderately well drained
Ex.W.D. - Excessively well drained

SHWT - Seasonal high water table
HWT - High water table
NS - Not suitable

*Hydrogeology*¹²

An understanding of the hydrogeology of an area is the first step toward evaluating the availability, occurrence, and chemical quality of the groundwater in the planning area. The void spaces between the rock materials that underlie Holden Beach constitute the reservoir in which the water is stored and the conduits through which the water moves. While a thorough examination of the geology and groundwater has not been completed at this time, there are pertinent facts that have been identified by the Regional Hydrologist with the North Carolina Department of Natural and Economic Resources.

Geographically, the Town of Holden Beach is in the Lumber River Basin. Groundwater resources supply all water needs for the town, hence Holden Beach is not located in any designated public water supply watershed.

The first aquifer encountered is the Post-Miocene Aquifer, a water table aquifer composed of unconsolidated sand; the aquifer exists between land surface and an estimated 45 feet below land surface (BLS). Underlying the Post-Miocene Aquifer is the Tertiary System Aquifer, an artesian aquifer occurring between 45 feet BLS and an estimated 90 feet BSL; consolidated limestone and unconsolidated sand provide the geologic framework for this aquifer. From an estimated 90 feet BLS to an estimated 1300 feet BLS is the Cretaceous System Aquifer. Groundwater is stored in unconsolidated sands under artesian and flowing artesian conditions. Basement hardrock is at an estimated 1300 feet BLS.

Because of a lack of data, the quality and quantity of groundwater native to each aquifer is uncertain. The quantity of groundwater in each aquifer is limited, a direct function of poor aquifer characteristics and the presence of unusable quality groundwater. Brackish groundwater supposedly occurs in parts of the Post-Miocene and Tertiary System Aquifer; brackish water occurs in the entire Cretaceous System Aquifer.

Groundwater recharge occurs on Holden Beach. Rainfall infiltrates directly into the Post-Miocene Aquifer. Since the Post-Miocene Aquifer is probably hydraulically connected to the Tertiary System Aquifer, recharge of the Post-Miocene is also effective recharge to the Tertiary System Aquifer.

¹²Memorandum from Richard Shiver, Regional Hydrologist, North Carolina Department of Natural and Economic Resources Wilmington, N. C. September 12, 1975.

Individual wells screened in the upper Post-Miocene Aquifer are the sources of potable water on Holden Beach. These wells are necessarily shallow to avoid lower brackish groundwater. Individual septic tanks saturate the island and the close proximity of shallow water wells to septic tank leachate poses a potential health hazard. A well-field probably would not be successful on the island because of unfavorable hydrogeology and hydrochemistry.

Holden Beach is a barrier island and its groundwater problems are summarized below:

- 1) Shallow wells in nearness to septic tanks;
- 2) Overdrafting supply of fresh groundwater initiates/accentuates salt water encroachment; and
- 3) Individual wells preclude monitoring groundwater quality changes on Holden Beach.

b. Fragile Areas

The following are areas which could easily be damaged or destroyed by inappropriate or poorly planned development:

Coastal Wetlands
Sand Dunes along the Outer Banks
Ocean Beaches and Shorelines¹³
Estuarine Waters
Public Trust Areas
Coastal Inlet Lands¹⁴
Special Aquifer Areas - Outer Banks and Barrier Islands

The definition and importance of each of these areas is described under the section in this report entitled "Areas of Environmental Concern."

However, detailed information regarding Lockwoods Folly Inlet is available from Corps of Engineers, Wilmington, N. C.¹⁵ Based on a 1961 survey of Lockwoods Folly Inlet by the Corps of Engineers and one in 1970 by the

¹³See Knowles, C. E., Jay Langfelder and Others *A Preliminary Study of Storm-Induced Beach Erosion for North Carolina* NCSU October 16, 1973.

¹⁴See Langfelder, Jay and Others *A Historical Review of Some of North Carolina's Coastal Inlets* Report No. 74-1 NCSU January 1974.

¹⁵Corps of Engineers, Wilmington District, Draft Environmental Statement "Lockwoods Folly Inlet Navigation Improvement" January 1976.

National Ocean Survey, the rate of accumulation of material on the ocean shoal was found to be approximately 180,000 cubic yards per year. In addition, maintenance dredging in the Atlantic Intracoastal Waterway at Lockwoods Folly Inlet during the same time interval required the removal of an average of 60,000 cubic yards per year. Thus, between 1961 and 1970, Lockwoods Folly Inlet entrapped a total of 240,000 cubic yards of littoral material per year or about 40 percent of the gross littoral drift at the inlet. During the period from 1961 to 1970, the ocean entrance channel was oriented in a southeasterly direction, which would facilitate tidal flow bypassing of material from Holden Beach to Long Beach. Conversely, the southeasterly inlet channel orientation would impair natural bypassing from Long Beach to Holden Beach. It is estimated that the total alongshore influx of sediments to the inlet amounts to approximately 600,000 cubic yards annually, of which 460,000 cubic yards are supplied by eastward transport from Holden Beach, and 140,000 cubic yards by westward transport from Long Beach. The total annual accumulation of sediments within the inlet shoal system is estimated at 240,000 cubic yards, comprised of the total 140,000 cubic yards moving westward from Long Beach and 100,000 cubic yards transported eastward from Holden Beach. The remaining 360,000 cubic yards of sediment entering the inlet complex from the east end of Holden Beach is transported to Long Beach by tidal flow action. The alongshore material transport deficits for the shores adjacent to Lockwoods Folly Inlet are 140,000 and 100,000 cubic yards at Holden Beach and Long Beach, respectively.

c. Areas with Resource Potential

Another fragile area on Holden Beach is the east end of the Beach on the property of John Herbert Holden. Mr. Holden has permitted the use of his property for local residents as a nature trail. The 2,000 feet trail enables one to view plants of the "ocean-spray community" as they grow in their natural habitat.

Section 2: Capacity of Community Facilities

Water System

With the exception of one small private water system serving approximately 12 cottages, there are not any community or public water systems. All potable water supplies are from individual wells. As noted in the section "Hydrogeology" of this report, there are severe problems on a Barrier island with

this type of water supply. A public water supply system as part of the Brunswick County Water System has been approved and contracts for construction are proposed to be let in 1976. The Holden Beach distribution system is outlined in an Engineering Report.¹⁶

Sewer System

All wastewater treatment is accomplished by means of individual septic-tank nitrification fields. Continued development of the Beach using this type of wastewater disposal threatens not only the groundwater supply, but adjacent surface waters as well.

Holden Beach along with Ocean Isle and Shallotte are part of the Southwest Brunswick County 201 wastewater planning area. It is anticipated that the study of alternatives will be completed between March 1976 and December 1976.

Thoroughfares

According to the Highway Capacity Manual,¹⁷ the practical capacity for two lanes plus parking for two-way traffic is 5700-8100 vehicles per day. Capacity is defined as the maximum number of vehicles which has a reasonable expectation of passing over a given section of a lane or a roadway in both directions during a given time period under prevailing roadway and traffic conditions. The 1974 average daily traffic count on NC 130 at the Holden Beach bridge was 1720. However, two consecutive 24-hour weekday counts made in August, 1975 at the same location had 5953 and 6164 vehicles. These counts were unadjusted for vehicles with 3 or more axles.¹⁸ Understandably, this artery is considerably more heavily traveled in the summer months.

However, the most critical highway problem is the one-lane bridge across the Intracoastal Waterway. It is the only access to the island and is dangerous in an emergency.

Educational Facilities

There are not any schools on Holden Beach.

¹⁶Pierson and Whitman, Inc. Engineering Report *Water System - Town of Holden Beach* August 1973

¹⁷Highway Research Board *Highway Capacity Manual* Special Report 87 1965

¹⁸Letter of Mr. E. R. Shuller, Traffic Survey Engineer N.C. Division of Highways August 26, 1975

Solid Waste Disposal

Holden Beach's Sanitation Department utilizes the county solid waste disposal landfill on the mainland.

Article V - Estimated Demand

Section 1: Population and Economy

Due to the small size of and the lack of historical data for Holden Beach, the forecasting of population is at best guesswork. It does not account for any future economic change as brought about by location of industry nearby or national recession.

HISTORIC POPULATION

	1960	1970	Percent Change 1960-1970	Ave. Percent of County 1960-1970
Holden Beach	30*	136	353.3	less than .01
Lockwoods Folly Twp.	4,289	4,748	10.7	20.5
Brunswick County	20,278	24,223	19.4	100.0

*Land Development Plan, Holden Beach, N. C. 1974

Source: U. S. Dept. of Commerce 1960 and 1970
U. S. Census of Population

AVERAGE PERMANENT RESIDENT POPULATION

	1973*	1974	1975
Holden Beach	170	180	N/A**
Brunswick County	29,800	31,900	35,621***

*As of July 1 according to N.C. Dept. of Administration, OSP

**Not available because of small data base

***As of January 1 according to Brunswick County Planning Department

POPULATION PROJECTIONS

Permanent*

	1980	1985	1990
Holden Beach	250	300	350

*Based on arithmetic mean projection

Seasonal Peak*

	1975	1980	1985	1990
Holden Beach	5000	6800	8600	10400

*Based on local officials, building permits

Holden Beach has tripled its permanent population since 1960. The permanent population is projected to increase arithmetically in the coming decade due to the attractiveness of the Beach.

Forecasting seasonal peak population is a much more difficult task. The present summer population is based on 8.5 persons per dwelling times approximately 600 dwelling units. Building permits over the last five years (1970-1974) averaged 43.6 new units per year. Assuming a continued issuance of building permits at this rate, then the seasonal peak population will increase by some 1800 persons every five years.

Over the last five years the Brunswick County economic picture has been very bright. There are more recent signs of a leveling off of this economic boom. According to two economic indicators such as personal income and employment characteristics, Brunswick County has improved but still lags behind the State in most cases. Since November 1974, the unemployment rate has continued to increase: January 1975 - 12.1%; May 1975 - 12.7%; and August 1975 - 14.8%.¹⁹ These figures are much the same as the rest of the nation's because of the recession.

Because Holden Beach's economy is based on tourism, it is difficult to project future economic conditions. Tourism and the construction of second homes is more dependent upon the state economy and national economy, which are beyond the control of the local decision-makers. However, our leisure-time industries are growing more and more each year. The only other industry is commercial fishing. While most of the fishing fleet is moored on the mainland side of the Intracoastal Waterway, a number of persons reside on the Beach and are employed by the fishing industry. The exact value added by this segment is unknown, but it is one of the commercial and sport fishing centers of the County. This is especially important at a time when statistics indicate that the total landing in quantity for shell-fish and finfish is decreasing (1960-73) in the State as a whole, while Brunswick County had its largest total landings in quantity ever recorded in 1972.²⁰

¹⁹N.C. Employment Security Commission

²⁰Easley, Jr. J. E. and Beth Sossamon *N.C. Fisheries Data* N. C. Agriculture Extension Service 1974 page 6 and 29

Section 2: Future Land Use Needs

Determining future land needs is a very important part of land use planning. While some growth will occur as a result of natural events, a great deal depends upon the amount of growth desired by the community.

Under "Estimated Demand" we have shown the growth that will probably occur based on recent trends. Yet, even more growth may be desired by the community. All available information (surveys, public meetings, interviews) indicates the people of Holden Beach want the community to continue to grow, but not at the expense of the characteristics which make it a unique beach.

Holden Beach has a finite amount of land upon which to develop. It is imperative that this resource be utilized wisely. The table below indicates the amount of land available for future development.

HOLDEN BEACH LAND USE

	Acres
Total Land Area	1765.0
Urban and built-up	144.0
Dredge fill islands	147.8
Low, sandy tidal marsh	591.4
Beach fore dune	144.5
Developable land area	<u>1027.8</u> 737.3

As previously noted approximately 6.2 and 15.9 percent of the present land is used for commercial and public uses, respectively. Provided these percentages remain constant, Holden Beach will have approximately 574.4 acres for future residential development.

The Zoning Ordinance adopted August 15, 1972, contains two residential districts: R1 and R2. R1 District permits single family dwelling units and requires a minimum of 5,000 square feet. R2 District permits single and multifamily dwelling units, motels, apartments, and campgrounds, and requires a minimum of 5,000 square feet. At present, approximately 95 percent of residentially zoned land is R1. Consequently, if all of the 574.4 acres for future residential land was developed in accordance with the existing zoning ordinance, then Holden Beach's maximum obtainable permanent population would be 18,436 people (4754 lots x 3.51 persons per dwelling unit and 250 lots x 7 persons per dwelling unit). Of course, the seasonal population

would be much more.

Consequently, residential land is available to accommodate estimated population demand without encroaching upon fragile areas, e. g., wetlands, sand dunes, and inlet and shoreline dynamic areas with certain limitations. These limitations include the need for essential community facilities (water and sewer) and prudent and responsible planned development which does not degrade the water quality of surface waters.

Section 3: Community Facilities Demand

Holden Beach has to have water and sewer facilities to accommodate not only future development but present development as well. Without these facilities, Holden Beach runs the risk of contamination of the health, economic, and recreational environment. The publicity associated with such a turn of events could easily destroy what so many citizens on the beach have worked for.

A map depicting the proposed water distribution system is on the next page.

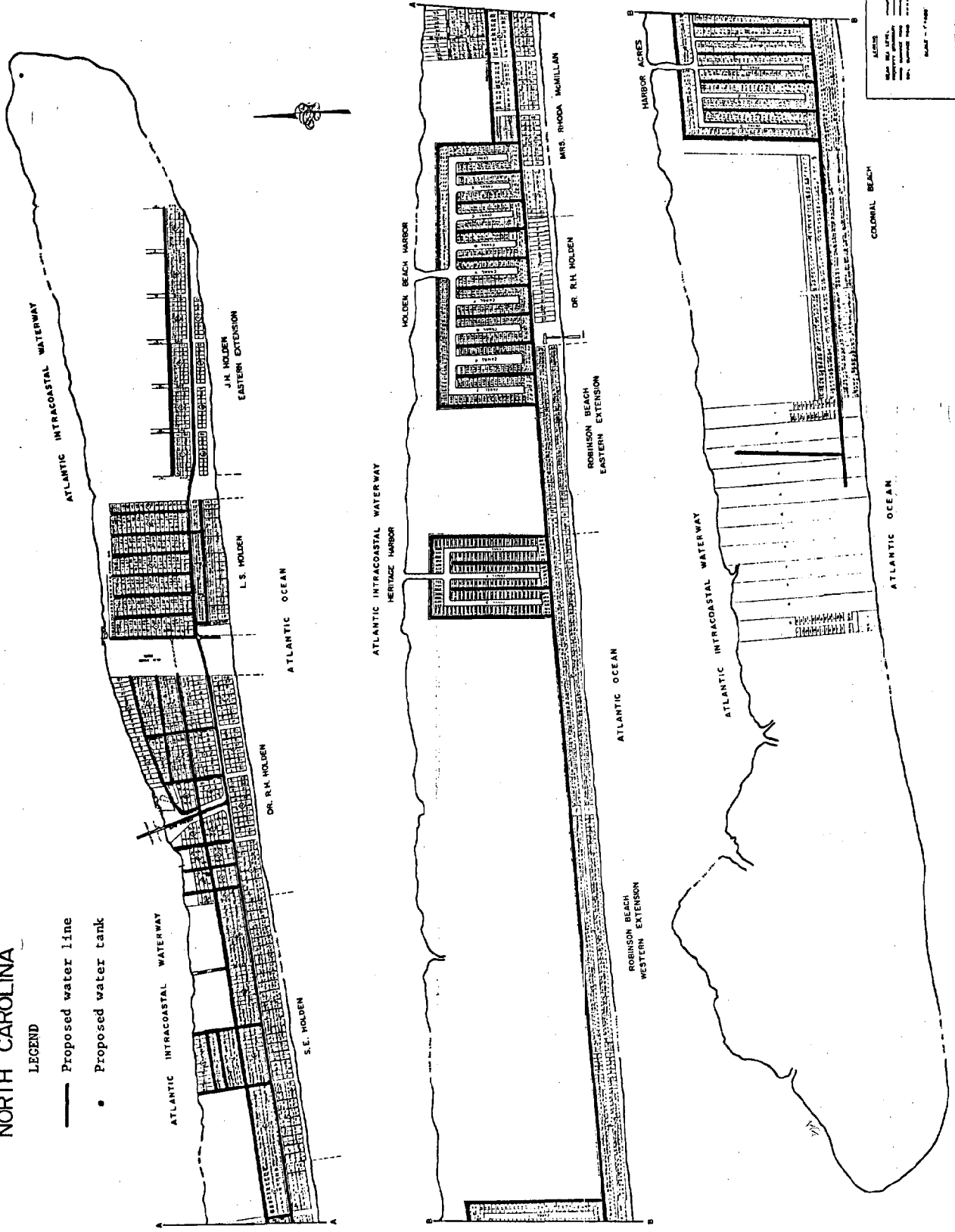
HOLDEN BEACH

NORTH CAROLINA

LEGEND

— Proposed water line

• Proposed water tank



Article VI - Plan Implementation

Prior to 1974, local land use plans were purely advisory in nature. Local governments often adopted comprehensive plans and then proceeded to ignore them by zoning land and building facilities in a manner inconsistent with the plan. Under the Coastal Area Management Act of 1974 the development of land use plans is just the initial phase of the coastal area management program; for this is a continuing process calling for periodic review (at least once after five years) and revision to keep the plan current, and for management of other governmental actions in a manner consistent with the plans.

The law requires each town desiring to develop its own implementation and enforcement plan to identify a "designated local official" to review, process, and issue permits in Areas of Environmental Concern.

While regulations called for in the act relate only to permit authority affecting designated Areas of Environmental Concern, the permits need to be coordinated with both the local land use plan and other existing regulations. The really crucial part of the program will be to see if the local plans can be effectively used to guide government actions--by local, state, and federal agencies--within the local jurisdiction.

Section 1: Intergovernmental Coordination

On Holden Beach, there are two local units of government which provide services to the island and have authority to levy taxes. These two units are: the Town of Holden Beach and the County of Brunswick. Historically, counties have been responsible for software services (i.e., health, education and welfare) while municipalities were responsible for hardware services (i.e., water, sewer, streets and sanitation). However with a changing demographic picture, both cities and counties have initiated services of both types.

Coordination of services between Holden Beach and Brunswick County have been achieved in some instances such as fire protection, refuse disposal, and water service. However, new agreements in other areas should be explored. Possible areas for joint services include recreation, wastewater treatment, emergency rescue service, building inspection, and beach erosion control. The degree to which any of these service agreements can be achieved will be determined by the cost involved. The cost in turn can be held to a minimum by land use control. Only Holden Beach has authority to regulate the use of the land on the island.

Coordination in the development of the Land Use Plan between Brunswick County and Holden Beach has been achieved through informal meetings by the planning staff and citizens' attendance at County Advisory Committee meetings.

Section 2: Land Classification System

The North Carolina Land Classification System contains five classes of land:

- a. Developed--Lands where existing population density is moderate to high and where there are a variety of land uses which have the necessary public services.
- b. Transition--Lands where local government plans to accommodate moderate to high density development during the following ten-year period and where necessary public services will be provided to accommodate that growth.
- c. Community--Lands where low density development is grouped in existing settlements or will occur in such settlements during the following ten-year period and which will not require extensive public services now or in the future.
- d. Rural--Lands whose highest use is for agriculture, forestry, mining, water supply, etc., based on their natural resources potential. Also, lands for future needs not currently recognized.
- e. Conservation--Fragile, hazard, and other lands necessary to maintain a healthy natural environment and necessary to provide for the public health, safety, or welfare.

These five classes provide a framework to be used by the Town to identify the general use of all lands within the corporate limits. Such a system presents an opportunity for Holden Beach to provide for its needs as well as to consider those of the whole state. Also, it is a statement of policy on where and to what density we want growth to occur, and where we want to conserve the beach's natural resources by guiding growth.

Applying this system to Holden Beach as shown on the accompanying map, land falls into three categories: Conservation, Transition, and Rural. Conservation represents all land identified as AECs and where soil conditions will not support development. Transition includes land that will be provided water and sewer service within the next ten years. Incidentally, the unit

LAND CLASSIFICATION MAP

(See Foldout)

cost of water and sewer depends upon the density of development permitted. The higher the density, the less unit cost per subscriber. The remainder of the land area is classified as Rural for future land needs not currently recognized.

Section 3: Potential Areas of Environmental Concern

Coastal Wetlands - General

Coastal wetlands are defined as "any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (whether or not the tide waters reach the marshland areas through natural or artificial watercourses), provided this shall not include hurricane or tropical storm tides. Salt marshland or other marsh shall be those areas upon which grow some, but not necessarily all, of the following salt marsh and marsh plant species: Smooth or salt water Cordgrass (Spartina alterniflora); Black Needlerush (Juncus roemerianus); Glasswort (Salicornia spp.); Salt Grass (Distichlis Spicata); Sea Lavender (Limonium spp.); Bulrush (Scirpus spp.); Saw Grass (Cladium Jamaicense); Cat-Tail (Typha spp.); Salt-Meadow Grass (Spartina Patens); and Salt Reed Grass (Spartina cynosuroides)." Included in this statutory definition of wetlands is "such contiguous land as the Secretary of Natural and Economic Resources reasonably deems necessary to affect by any such order in carrying out the purposes of this Section." (G.S. 113-230 (a))

For policy purposes, coastal wetlands may be considered in two categories: (1) low tidal marsh; (2) other coastal marshlands which have different significance and policy implications.

Coastal Wetlands - Low Tidal Marshland

a. Description. Defined as marshland consisting primarily of Spartina alterniflora and usually subject to inundation by the normal rise and fall of lunar tides.

b. Significance. Low tidal marshland serves as a critical component in the coastal ecosystem. The marsh is the basis for the high net yield system of the estuary through the production of organic detritus (partially decomposed plant material) which is the primary input source for the food chain of the entire estuarine system. Estuarine dependent species of fish and shellfish such as menhaden, shrimp, flounder, oysters and crabs currently make up over 90 percent of the total value of North Carolina's commercial catch.

In addition, the roots and rhizomes of the Spartina alterniflora serve as waterfowl food and the stems as wildlife nesting material. Low tidal marsh also serves as the first line of defense in retarding shoreline erosion. The plant stems and leaves tend to dissipate wave action while the vast network of roots resists soil erosion. Marshes of this type operate additionally as

land uses allocation of this type shall be given to development which requires water access and cannot function anywhere else, such as ports, docks and marinas, provided that the actual location of such facilities within the marsh consider coastal, physical and biological systems and further provided that feasible alternatives regarding location and design have been adequately considered and need for such development can be demonstrated. Such allocation may only be justified by the projected land use demands and by community development objectives, but in no case shall the allocation exceed the capacity of the marshland system to sustain losses without harm to the estuarine ecosystem unless the losses would be offset by a clear and substantial benefit to the public.

Estuarine Waters

a. Description. Estuarine waters are defined in G.S. 113-229 (n) (2) as, "all the water of the Atlantic Ocean within the boundary of North Carolina and all the waters of the bays, sounds, rivers, and tributaries thereto seaward of the dividing line between coastal fishing waters and inland fishing waters, as set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Conservation and Development filed with the Secretary of State entitled 'Boundary Lines, North Carolina Commercial Fishing-Inland Fishing Waters, revised March 1, 1965,'" or as it may be subsequently revised by the Legislature.

b. Significance. Estuaries are among the most productive natural environments of North Carolina. They not only support valuable commercial and sports fisheries, but are also utilized for commercial navigation, recreation, and aesthetic purposes. Species dependent upon estuaries such as menhaden, shrimp, flounder, oysters and crabs make up over 90 percent of the total value of North Carolina's commercial catch. These species must spend all or some part of their life cycle in the estuary. The high level of commercial and sports fisheries and the aesthetic appeal of coastal North Carolina is dependent upon the protection and sustained quality of our estuarine areas.

c. Policy Objective. To preserve and manage estuarine waters so as to safeguard and perpetuate their biological, economic and aesthetic values.

traps for sediment originating from upland runoff thus reducing siltation of the estuarine bottoms and consequent detriment to marine organisms.

c. Policy Objective. To give the highest priority to the preservation of low tidal marshland.

d. Appropriate Land Uses. Appropriate land uses shall be those consistent with the above policy objective. These marshes should be considered unsuitable for all development which will alter their natural functions. Inappropriate land uses include, but are not limited to the following examples: restaurants and businesses; residences, apartments, motels, hotels, and trailer parks; parking lots and offices; spoil and dump sites; wastewater lagoons; public and private roads and highways; and factories. Examples of acceptable land uses may include utility easements, fishing piers, docks, certain agricultural uses except when excavation or filling affecting estuarine or navigable waters is involved, and such other uses which do not significantly alter the natural functions of the marsh.

Coastal Wetlands - Other Coastal Marshland

a. Description. All other marshland which is not low tidal marshland and which contains the species of vegetation as listed in the first paragraph under Coastal Wetlands - General.

b. Significance. This marshland type also contributes to the detritus supply necessary to the highly productive estuarine system essential to North Carolina's economically valuable commercial and sports fisheries. The higher marsh types offer quality wildlife and waterfowl habitat depending on the biological and physical conditions of the marsh. The vegetative diversity of wildlife types than the limited habitat of the low tidal marsh. This marshland type also serves as an important deterrent to shoreline erosion especially in those marshes containing heavily rooted species. The defense system of rhizomes and roots of Juncus roemerianus are highly resistant to erosion. In addition, the higher marshes are effective sediment traps.

c. Policy Objective. To give a high priority to the preservation and management of the marsh so as to safeguard and perpetuate their biological, economic and aesthetic values.

d. Appropriate Land Uses. Appropriate land uses shall be those consistent with the above policy objective. Highest priority shall be allocated to the conservation of existing marshlands. Second priority for

d. Appropriate Uses. Appropriate uses shall be those consistent with the above policy objective. Highest priority shall be allocated to the conservation of estuarine waters. The development of navigational channels, the use of bulkheads to prevent erosion, and the building of piers or wharfs where no other feasible alternative exists are examples of land uses appropriate within estuarine waters, provided that such land uses will not be detrimental to the biological and physical estuarine functions and public trust rights. Projects which would directly or indirectly block or impair existing navigation channels, increase shoreline erosion, deposit spoils below mean high tide, cause adverse water circulation patterns, violate water quality standards, or cause degradation of shellfish waters are generally considered incompatible with the management of estuarine waters.

Renewable Resource Areas - Watersheds or Aquifers - General

Public water supply watersheds or aquifers are defined as areas that are present sources of public water supply, as identified by the N. C. Commission for Health Services or the Environmental Management Commission, or that are classified for water supply pursuant to G.S. 143-214.1.

Renewable Resource Areas - Watersheds or Aquifers - Special Aquifer Areas - Outer Banks and Barrier Islands

a. Description. Areas of well-drained sands that extend downward from the surface to include an extensive area of fresh water that is an important source for a public water supply identified by the North Carolina Department of Human Resources, Division of Health Services, or that are classified for water supply use pursuant to G.S. 143-214.1. The information necessary to identify these areas will be supplied by the Division of Health Services in cooperation with the State Geologist.

b. Significance. Naturally occurring aquifers on the outer banks and barrier islands generally occur in well drained sands at relatively shallow depth. Recharge to these aquifers is through precipitation and, occasionally, indirectly from adjoining freshwater marshlands. Very little filtration of chemical contaminants or of viruses is afforded by the sand materials, and the potential exists for extensive pollution of these supplies rendering them unsafe as sources of public water supply. Additionally, a rate of water withdrawal that greatly exceeds water recharge from the surface can result in saltwater intrusion rendering all or part of the aquifer unsuitable as a water supply source.

c. Policy Objective. To eliminate as nearly as possible the potential for contamination of special aquifer areas that may result in a public health hazard or significantly limit the value of the aquifer as water supply source.

d. Appropriate Land Uses. Appropriate land uses shall be those consistent with the above policy objective. Special aquifer areas shall be planned for those kinds of development that will not rely upon subsurface waste disposal systems, result in injection of wastes into the ground, significantly increase the risk of accidental discharge onto the surface of liquid or other easily soluble contaminants, or increase the withdrawal of water from the aquifer to a rate that may cause saltwater intrusion. Inappropriate uses would include chemical or fuel processing or storage facilities or residential development employing septic tank sewage disposal systems. These AECs should be planned for low intensity of use where feasible, and new intensive development that must occur should be provided with public waste water disposal systems.

Areas Subject to Public Rights - General

Areas such as waterways and lands under or flowed by tidal waters or navigable waters, to which the public may have rights of access or public trust rights and areas which the State of North Carolina may be authorized to preserve, conserve, or protect under Article XIV, Section 5, of the North Carolina Constitution.

Areas Subject to Public Rights - Certain Public Trust Areas

a. Description. All waters of the Atlantic Ocean and the lands thereunder from the mean high water mark to the seaward limit of State jurisdiction; all natural bodies of water subject to measurable lunar tides and lands thereunder to the mean high water mark; all navigable natural bodies of water and lands thereunder to the mean high water mark or ordinary high water mark as the case may be, except privately owned lakes to which the public has no right of access; all waters in artificially created bodies of water in which exists significant public fishing resources or other public resources, which are accessible to the public by navigation from bodies of water in which the public has rights of navigation; all waters in artificially created bodies of water in which the public has acquired rights by prescription,

custom, usage, dedication or any other means. In determining whether the public has acquired rights in artificially created bodies of water, the following factors shall be considered: (i) the use of the body of water by the public; (ii) the length of time the public has used the area; (iii) the value of public resources in the body of water; (iv) whether the public resources in the body of water are mobile to the extent that they can move into natural bodies of water; (v) whether the creation of the artificial body of water required permission from the State; and (vi) the value of the body of water to the public for navigation from one public area to another public area.

For purposes of the description in Areas Subject to Public Rights - General and Certain Public Trust Areas, the following definitions shall apply:

- (1) Mean High Water Mark means the line on the shore established by the average of all high tides. It is established by survey based on available tidal datum. In the absence of such datum, the mean high water mark shall be determined by physical markings or comparison of the area in question with an area having similar physical characteristics for which tidal datum is readily available.
- (2) Navigable means navigable-in-fact.
- (3) Navigable-in-fact means capable of being navigated in its natural condition by the ordinary modes of navigation includes modes of navigation used for recreational purposes. The natural condition of a body of water for purposes of determining navigability shall be the condition of the body of water at mean high water or ordinary high water as the case may be, and the condition of the body of water without man-made obstructions and without temporary natural obstructions. Temporary natural conditions such as water level fluctuation and temporary natural obstructions which do not permanently or totally prevent navigation do not make an otherwise navigable stream non-navigable.
- (4) Ordinary High Water Mark means the natural or clear line impressed on the land adjacent to the waterbody. It may be established by erosion or other easily recognized characteristics such as shelving, change in the character of the soil, destruction of terrestrial vegetation or its inability to grow, the presence of litter and debris, or other appropriate means which consider the characteristics of the surrounding area. The ordinary high water mark does not extend beyond the well defined banks of a river where such banks exist.

b. Significance. The public has rights in these waters including navigation and recreation. In addition, these waters support valuable commercial and sports fisheries, have aesthetic value, and are important potential resources for economic development.

c. Policy Objective. To protect public rights for navigation and recreation and to preserve and manage the public trust waters so as to safeguard and perpetuate their biological, economic and aesthetic value.

d. Appropriate Uses. Appropriate uses shall be those consistent with the above policy objective. Any land use which interferes with the public right of navigation, or other public trust rights, which the public may be found to have in these waters, shall not be allowed. The development of navigational channels, drainage ditches, the use of bulkheads to prevent erosion, and the building of piers or wharfs are examples of land uses appropriate within public trust waters provided that such land uses will not be detrimental to the biological and physical functions and public trust rights. Projects which would directly or indirectly block or impair existing navigation channels, increase shoreline erosion, deposit spoils below mean high tide, cause adverse water circulation patterns, violate water quality standards, or cause degradation of shellfish waters are generally considered incompatible with the management of public trust waters.

Natural Hazard Areas - General

Natural hazard areas where uncontrolled or incompatible development could unreasonably endanger life or property, and other areas especially vulnerable to erosion, flooding, or other adverse effects of sand, wind, and water.

Natural Hazard Areas - Sand Dunes along the Outer Banks

a. Description. Dunes are defined as ridges or mounds of loose wind-blown material, usually sand.

b. Significance. Dunes comprise a major portion of the outer banks and barrier islands and represent a protective barrier for the sounds, estuaries, and mainland. Development with inadequate design or construction may alter the protective character of the dunes and subject property to an increased risk of substantial damage due to the adverse effect of wind and water.

c. Policy Objective. To insure that development which is undertaken utilizes sound engineering practices to minimize the erosive effects of wind and water.

d. Appropriate Land Uses. Appropriate land uses shall be those consistent with the above policy objective. Only those developments that can be safely undertaken utilizing recognized engineering practices and site preparation and site maintenance to minimize unnecessary damage from wind and water should be allowed.

Natural Hazard Areas - Ocean Beaches and Shorelines (on the Outer Banks)

a. Description. These are defined as land areas without vegetation covering, consisting of unconsolidated soil material that extends landward from the mean low tide to a point where any one or combination of the following occur: (1) vegetation, or (2) a distinct change in predominant soil particle size, or (3) a change in slope or elevation which alters the physiographic land form.

b. Significance. Sand deposits of ocean beaches and shorelines represent a dynamic zone which does not afford long term protection for development. The nature of tidal action and the force of storms is such that they cause the beach areas to constantly shift. Littoral drift is a natural phenomenon whereby sand is removed from beaches by wave action and littoral currents and is deposited upon a different stretch of the beach. The action also shifts the line of high tide and low tide. Ocean beaches and shorelines are valuable for public and private recreation and are located within a natural hazard area. Development within this dynamic zone may result in loss of property and possible loss of life.

c. Policy Objective. To preserve to the greatest extent feasible the opportunity to enjoy the physical, aesthetic, culture and recreational qualities of the natural shorelines of the State and to allow that type development which will withstand the prevalent natural forces and not unreasonably interfere with the rightful use and enjoyment of the beach area.

d. Appropriate Land Uses. Appropriate land uses shall be those consistent with the above policy objective.

Natural Hazard Areas - Coastal Floodplains

a. Description. Coastal floodplain is defined as the land areas

adjacent to coastal sounds, estuaries or the ocean which are prone to flooding from storms with an annual probability of one percent or greater (100 year storm). These areas are analogous to the 100 year floodplain on a river. Information necessary to identify these areas will be supplied by the State Geologist.

b. Significance. Coastal floodplains are those lands subject to flooding or wave action during severe storms or hurricanes. They are lands where uncontrolled, incompatible, or improperly designed building, structures, facilities, and developments can unreasonably endanger life and property. Except for those portions of the areas lying within estuarine or ocean erodible areas, they are not generally or necessarily subject to severe erosion or dynamic action leading to replacement of the land with a body of water. In most instances, structures within this area do not obstruct the flow of waters or create any additional back waters.

c. Policy Objective. To ensure that all buildings, structures, facilities and developments are properly designed and built to maintain their stability, integrity, and safety in the event of flood surge from a 100 year storm.

d. Appropriate Land Uses. Appropriate land uses shall be those consistent with the above policy objective. It is reasonable to allow a certain degree of development if it is carefully controlled and meets stringent engineering standards for stability, integrity and safety during a 100 year storm. (Code of Federal Regulations, Title 24, Chapter 10, Subchapter B)

Natural Hazard Areas - Excessive Erosion Areas - General

Areas where geologic and soil conditions are such that there is substantial possibility of excessive erosion or seismic activity.

Natural Hazard Areas - Excessive Erosion Areas - Coastal Inlet Lands

a. Description. Defined as the natural zone of migration of coastal inlets. Such a zone covers all areas that are expected to be eroded by future inlets and inlet migration based on the best available data and studies, including relevant historical photography, surveys, maps and other appropriate information. The information necessary to identify these areas will be supplied by the State Geologist.

b. Significance. The particular location of the inlet channel is a temporary one, as such channels are subject to extensive migration.

Coastal inlet lands are extremely dynamic land areas that are highly susceptible to becoming completely displaced by water.

c. Policy Objective. To limit unnecessary hazards to life or property or unreasonable requirements for public expenditures to protect property or maintain safe conditions.

d. Appropriate Land Uses. Appropriate land uses shall be those consistent with the above policy objective. Recreational or conservation activities and easements for access represent the preferred land use. Moveable temporary structures for recreational purposes may be appropriate. Permanent or substantial residential, commercial, institutional, or industrial structures are not appropriate uses in coastal inlet lands.

Natural Hazard Areas - Excessive Erosion Areas - Ocean Erodible Areas

a. Description. Defined as the area above mean high water where excessive erosion has a high probability of occurring. In delineating the landward extent of this area a reasonable 25-year recession line shall be determined using the best scientific data available. The information necessary to identify these areas will be supplied by the State Geologist.

b. Significance. Ocean erodible areas are extremely dynamic lands highly susceptible to becoming completely displaced by water.

c. Policy Objective. To limit unnecessary hazards to life or property or unreasonable requirements for public expenditures to protect property or maintain safe conditions.

d. Appropriate Land Uses. Appropriate land uses shall be those consistent with the above policy objective. Permanent or substantial residential, commercial, institutional or industrial structures are not appropriate uses in estuarine and sound and river erodible areas unless stabilization has been achieved along the affected reach. Recreational, rural and conservation activities represent appropriate land uses in those erodible areas where shoreline protective construction has not been completed.

Development Standards Applicable to All AECs

a. No development should be allowed in any AEC which would result in a contravention or violation of any rules, regulations, or laws of the State of North Carolina or of local government in which the development takes place.

b. No development should be allowed in any AEC which would have a substantial likelihood of causing pollution of the waters of the State to the extent that such waters would be closed to the taking of shellfish under standards set by the Commission for Health Services pursuant to G.S. 130-169.01.

Section 4: Location and Development Standards

These standards serve two purposes: as a basis for the Land Use Plan, and as a guide to public officials and citizens for evaluating development proposals. These standards state where the various land uses should be located and how land should be developed for each land use. Residential areas should:

- Have public water and sewer service within corporate limits.
- Have minimum lot sizes of 20,000 square feet where community/public water and sewer service is unavailable; and 15,000 square feet where either water and sewer facilities are available, but not both.
- Be bound but not crossed by major thoroughfares.
- Construct utilities including electric and telephone lines underground, where the ground water table prohibits underground electric wires, utility poles should follow rear property lines.
- Not located in flood prone areas or, in the case of beach communities, be above minimum building elevation and flood proofed as determined by HUD - Federal Insurance Administration.
- Provide locations for churches, schools, recreation, and neighborhood serving stores near their center.
- Be buffered from other land uses.

Commercial areas should:

- Locate near intersections of major thoroughfares to better serve trade areas.
- Not be permitted to develop in strips, but rather in compact, grouped, and consolidated into functional units.
- Provide adequate off-street parking with designated entrances and exits.
- Have adequate space; neighborhood shopping centers should range from 3 to 6 acres in size while community shopping centers should range from 10 to 30 acres in size.
- Have compatible signs which do not obstruct sight.

Office and institutional areas should:

- Serve as buffers between residential areas and commercial or industrial uses.

- Locate in planned office and institutional parks.
- Have adequate off-street parking facilities.
- Have compatible signs which do not obstruct sight.

Article VII - Conclusion

The Land Use Plan culminates six months' work by the Town of Holden Beach, plus the substance of several public meetings and a survey, where input was given by property owners and residents of the Island.

Obstacles to present and future development are clearly identified. Means and methods for dealing with development problems are recommended. The protection of the public health, safety, and welfare of present and future residents can be assured provided Town Council implements the recommendations listed herein as development policy.

Major conclusions of the Land Use Plan are:

- Existing development threatens the quality of surface waters and groundwater.
- Providing water and sewer service and other municipal services to the present pattern of development (density) will result in higher economic, environmental, and personal costs.
- Beach access, recreation facilities, water safety, rescue service, fire and police protection, and street surfacing are all municipal services in need of improvement.
- Holden Beach requires the professional services of full-time qualified personnel to insure the efficient and wise management of the Island's resources.
- Unless the proper controls are implemented, Areas of Environmental Concern face significant deterioration which would lessen the attractiveness of the Beach and would violate the laws of the State of North Carolina.

APPENDIX

Citizen Opinion Survey for the Town of Holden Beach

Holden Beach is preparing a land use plan in order to comply with the requirements of the Coastal Area Management Act of 1974. One of the most important aspects of land use planning is that the plan adequately reflects citizen opinions and attitudes toward the use of the community's land--both public and private. The following survey is intended to give each citizen the opportunity to express his opinion on land use problems and issues. Your cooperation in answering the following questions will be appreciated.

Upon completing the questionnaire, please return to:

Your local real estate agent or
Mrs. Lucille C. Burks
Town Clerk
Town Hall - 110 Rothschild St.
Holden Beach, N.C. 28462

Check () appropriate space.

1. Are you a property () owner or () renter?
2. Are you a permanent resident of Holden Beach? () yes () no
3. If not, how often do you reside in Holden Beach?
() weekdays () weekends () several weeks () summer months
4. How did you first learn about Holden Beach?
() from a friend or relative
() advertisement for rental or sale
() previous vacation
() other _____
5. What is your age? _____
6. Do you live in a: () single family house
() duplex
() mobile home -- at Holden Beach?
() apartment
7. During the next five years would you like to see the population of Holden Beach --
() stay the same
increase () 10% () 30% () 50% () 75%
decrease () 10% () 30% () 50% () 75%
8. Which of the following types of development would you like to see more or less of in Holden Beach?

	<u>More</u>	<u>Less</u>
single-family housing	()	()
apartments	()	()
condominiums	()	()
mobile homes	()	()
commercial trade	()	()
commercial services	()	()
public open space	()	()
public recreation facilities (playgrounds and parks)	()	()
other (specify) _____		
9. For what reasons did you choose to live in Holden Beach?
() close to work
() pleasant surroundings
() reasonable rent
() reasonably priced land and house
() close to family and friends
() single-family beach
other _____
10. In which of the following areas do you feel more public funds should be spent?

	<u>More</u>	<u>Less</u>
garbage collection	()	()
water and sewer service	()	()
fire and police protection	()	()
schools	()	()
parks and recreational (facilities and programs)	()	()
streets	()	()
environmental protection	()	()
water safety	()	()
town management	()	()
medical services	()	()
rescue service	()	()
erosion control	()	()
beach access	()	()
other _____		

11. What do you like most about Holden Beach?

12. What do you like least about Holden Beach?

13. Do you think development should be permitted in the following areas --

	<u>Never</u>	<u>With Restrictions</u>	<u>Always</u>
on lands near inlets	()	()	()
on any marshland	()	()	()
on frontal dunes	()	()	()
other _____			

14. In those areas that you have indicated no development, would you support the purchase by public agency? () Yes () No

15. Is there any particular area or type of area within the Town limits that you feel is unique or special and should be preserved or protected in its present state or form?

16. Please use the following space to make any additional comments you would like.

Thank you for your help and cooperation. This questionnaire should be returned to the Town Hall by August 15th.

Mrs. Lucille C. Burks
Town Clerk
Town Hall - 110 Rothschild St.
Holden Beach, N.C. 28462

Rare and Endangered Species*

BRUNSWICK COUNTY

Amphibians

Gopher Frog - Rana Aërolata amphibian

Status: Peripheral - Undetermined in North Carolina

Reptiles

American alligator - Alligator Mississippiensis

General Comments: Protected, North Carolina, but development and alteration of habitat endangers species.

Status: Peripheral - Endangered in North Carolina and nationally

Coral Snake - Micurus Fulvius

General Comments: Very Secretive, North Carolina northern limit range

Status: Peripheral - Rare in North Carolina

Eastern Diamond Rattlesnake - Crotalus Adamanteus

General Comments: North Carolina northern limit range

Status: Peripheral - Rare in North Carolina

Vascular Plants

Sagittaria teres

Preferred Habitat: Acid, Sandy ponds and bogs

General Comments: Very rare

Status: Rare

Utricularia Olivacea

Preferred Habitat: Ponds

General Comments: Very rare

Status: Rare and endangered

Heterotheca Correllii

Preferred Habitat: Sandy woods

General Comments: Very rare

Status: Rare

*Source: North Carolina Department of Natural and Economic Resources,
Preliminary list of Endangered Plant and Animal Species in
North Carolina, June 1973.

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